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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,433	10/02/2003	Mingming Fang	28569/38510	9007

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EXAMINER
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GEORGE, PATRICIA ANN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 11/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/677,433

Applicant(s)

FANG ET AL.

Examiner

Patricia A. George

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 14-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Amendment*

Amendments have been received and are acknowledged.

### *Claim Rejections - 35 USC § 112*

All 35 USC § 112 rejections have been withdrawn from claims 14-22, in view of amendments.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 14-22 rejected under 35 U.S.C. 103(a) as being obvious over Mathur et al. of US 2004/0216388A1 in view of Ross et al. of U.S. 6,380,295 B1 and in further view of Mabic et al. of The R&D Notebook: A publication of the Laboratory Water Division of Millipore; RD006; Quantification study of a point-of-use ultrafiltration device for the production of pyrogen-free ultrapure water; (Research and Development,

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Laboratory Water Division, Millipore S.A., Saint-Quentin-en-Yvelines, France

Corporation; Copyright 2001).

Mathur discloses a method of planarizing or polishing a surface (p. 15, l.1-2) comprising contacting a surface (p. 42, l.5) with a slurry composition (p.15, l.1-2) comprising a liquid carrier (p.47, l.52), and (b) solids i.e. abrasives (p.45, l. 1-3), such as talc (p.40, 15; which smectite is known to defined from, see conclusion section for reference) comprising about 0.5 wt. % (p.45, l.6) up to 60 wt. % (p.45, l.3) which overlaps the claimed range of 10-100 wt %, non-sphericals having a size of 0.01 to 1 micron (p.61, l.12-13 and up to 2 micron in example 1) a range overlapping the claimed range of 0.02 to 20 micron.

Although Mathur discloses the use of talc, which smectite can be derived of, and that slurry compositions, need to avoid ions with high nobilities, such as Na<sup>+</sup> (p.30, l.7). Mathur is silent as to the use of, method of obtaining ion-exchanged smectite clay.

Ross et al. teaches clay compositions for nanocomposites containing compositions (ti.). Ross teaches smectite clays, and an ammonium compound which reacts via ion-exchange mechanisms with the smectite clay (ab.). Ross teaches the particles are prepared by washing them in water (ab.); adding a water-soluble (ab.); the quaternary ammonium compound which reacts via an ion exchange mechanism with the smectite clay; a commensurate number of exchangeable metal cations in the interlayer spaces (col.5, l.20-23). Ross teaches the clay is dispersed in a concentration of water, and because of the reaction of onium salts with ion-

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exchangeable clays form hydrophobic materials in water that can be conveniently filtered (col.3, l.53).

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to modify the invention of a slurry composition comprising clay talc, of Mathur, to include the type of clay, smectite, a the method for preparation of use, water washing and ion-exchanging with ammonium compounds to remove sodium, as Ross, because Mathur teaches slurry compositions, are made of talc, and need to avoid ions with high motilities, such as sodium, which undergo reaction with wafer materials.

Although Mathur and Ross both teaches the it is conventional and convenient to filter the concentration of clay dispersed in water, they are silent as to the method for filtering, a hollow-fiber tangential flow filtration apparatus.

Millipore teaches filtration of sodium cations (pg. 4, l.3), by flowing a dispersion over a hollow-fiber tangential flow filtration (p.3, l.3), as in claims 14 and 15.

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to modify the invention of a method of preparation and use of slurry composition with ion-exchanged smectite, as in the combined invention of Mathur and Ross, with the invention filtration of sodium cations, by flowing a dispersion over a hollow-fiber tangential flow filtration, as Millipore, because Mathur and Ross teach to filter the concentration of clay dispersed in water is convenient and conventional.

As for claim 16, Mathur discloses the surface is from an integrated circuit (P. 15, l. 1-2), a memory disk, or a rigid disk surface.

As for claim 17, Mathur discloses the composition further includes a chemical accelerator selected from the group consisting of: a peroxide (P. 31, l. 4), a sulfate (P. 32, l.4), a persulfate (P. 31, l.1), and a nitrate (P. 31, l. 4-5).

As for claim 18, Mathur discloses the chemical accelerator is selected from the group consisting of: hydrogen peroxide (P. 31, l. 4), ammonium persulfate (P. 31, l.1), iron (III) nitrate (P. 31, l. 5-6), and hydroxylamine nitrate.

As for claim 19, see discussion above to claim 14.

As for claim 20, 21, and 22, in example 3, Mathur discloses the ion-exchanged smectite clay was filtered through a Whatman filter having a pore size of 2. um (p. 79, l. 8) which teaches a particle size that is encompassed by all claimed ranges.

### ***Response to Arguments***

Applicants' argument are persuasive with respect to the fact that a portion of the subject matter relied on in the rejection does not get the effective filing date of the provisional. However, the reference still qualifies for the prior art under 103(a) for the portions of the reference relied on in the new office action above.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: U.S. 5,942,015 teaches average CMP slurry particles for silicates such as talc, clays, and montmorillonite are about 0.1 to about 50 microns, typically from 0.1 to 30 microns.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia A. George whose telephone number is (571) 272-5955. The examiner can normally be reached between 7:00am and 4:30pm on weekdays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



PAG  
10/05

**NADINE G. NORTON**  
**SUPERVISORY PATENT EXAMINER**

